Chronology of the Marsili Basin (Southern Tyrrhenian Sea) from new high resolution magnetic data

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Inversion of new high-resolution magnetic data from the Marsili volcanic seamount and the surrounding basin in the Tyrrhenian Sea reveals NNE-SSE magnetization stripes ranging from the Matuyama chron to the Brunhes chron, including the short positive Jaramillo subchron. The detailed magnetic chronology shows that from the Matuyama chron the average half spreading rate was about 1.5 cm/yr, with a slight decrease between the Jaramillo and the Brunhes events, when the growth of the volcanic edifice overcame lateral spreading. Magnetic anomalies directly correlated with the seamount edifice indicate huge hydrothermal alteration which affects the top of the volcano. Statistical analysis of spreading rate and volume of erupted lava indicates that at the beginning of the Jaramillo subchron (1.07 Ma) the Marsili basin evolved from pure horizontal spreading to a super-inflation of basaltic volcanism forming the seamount as consequence of tearing of the Ionian slab. Our data gives us a snapshot of the geodynamic transition from an active backarc spreading phase to the vertical superinflation of the seafloor due to a Pleistocenic detachment of the Ionian slab.